# Locally Equivalent Weights for Bayesian MrP

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# Real Data: Marital Name Change Survey

Analysis of changing names after marriage[1].

- **Target population:** ACS survey of US population 2017–2022[2]
- **Survey population:** Marital Name Change Survey (from Twitter)[3]
- **Respose:** Did the female partner keep their name after marriage?
- For regressors, use bins of age, education, state, and decade married.

| | |
|---|---|
| Survey observations: | $N_S = 4,364$ |
| Target observations (rows): | $N_T = 4,085,282$ |

| | |
|---|---|
| Uncorrected survey mean: | $\frac{1}{N_S}\sum_{i=1}^{N_S} y_i = 0.462$ |
| Raking: | $\hat{\mu}_{\text{CW}} = 0.263$ |
| MrP: | $\hat{\mu}_{\text{MrP}} = 0.288 \quad (\text{Post. sd} = 0.0169)$ |

[1] Based on Alexander (2019).

[2] Ruggles et al. 2024.

[3] Cohen 2019.

# Covariate balance for primary effects

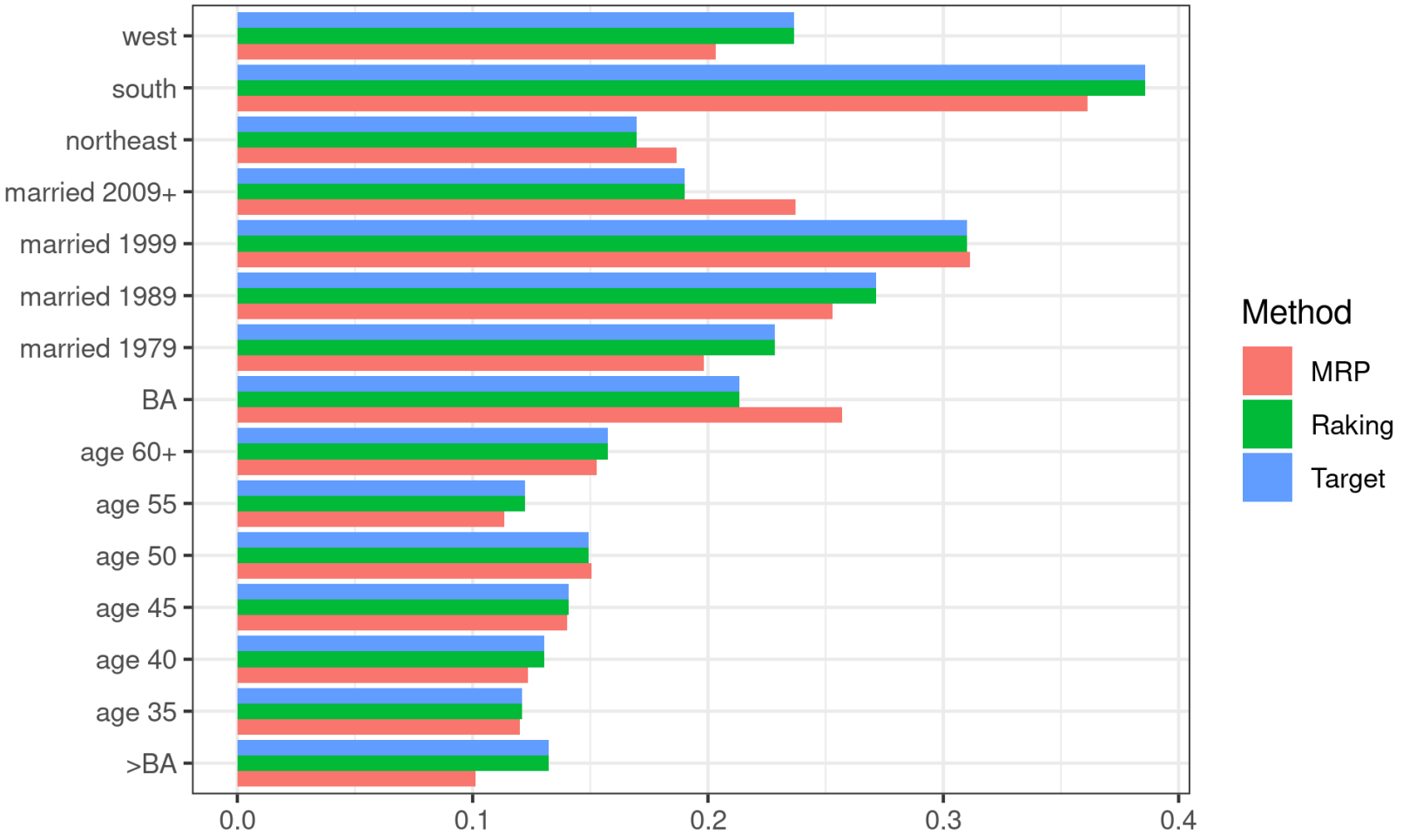


**Figure 1:** Imbalance plot for primary effects

# Covariate balance for interaction effects

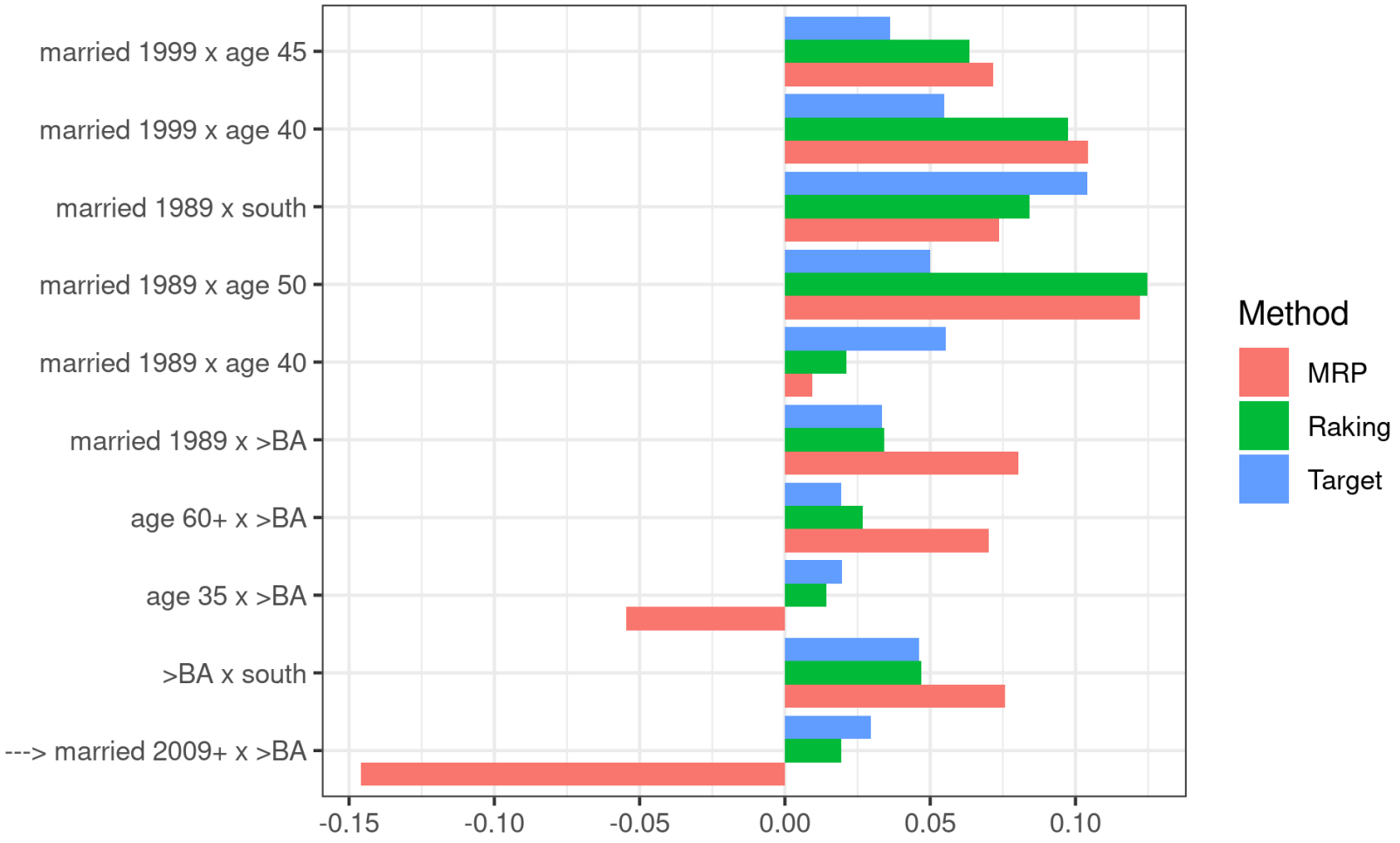


**Figure 2:** Imbalance plot for select interaction effects

# Predictions

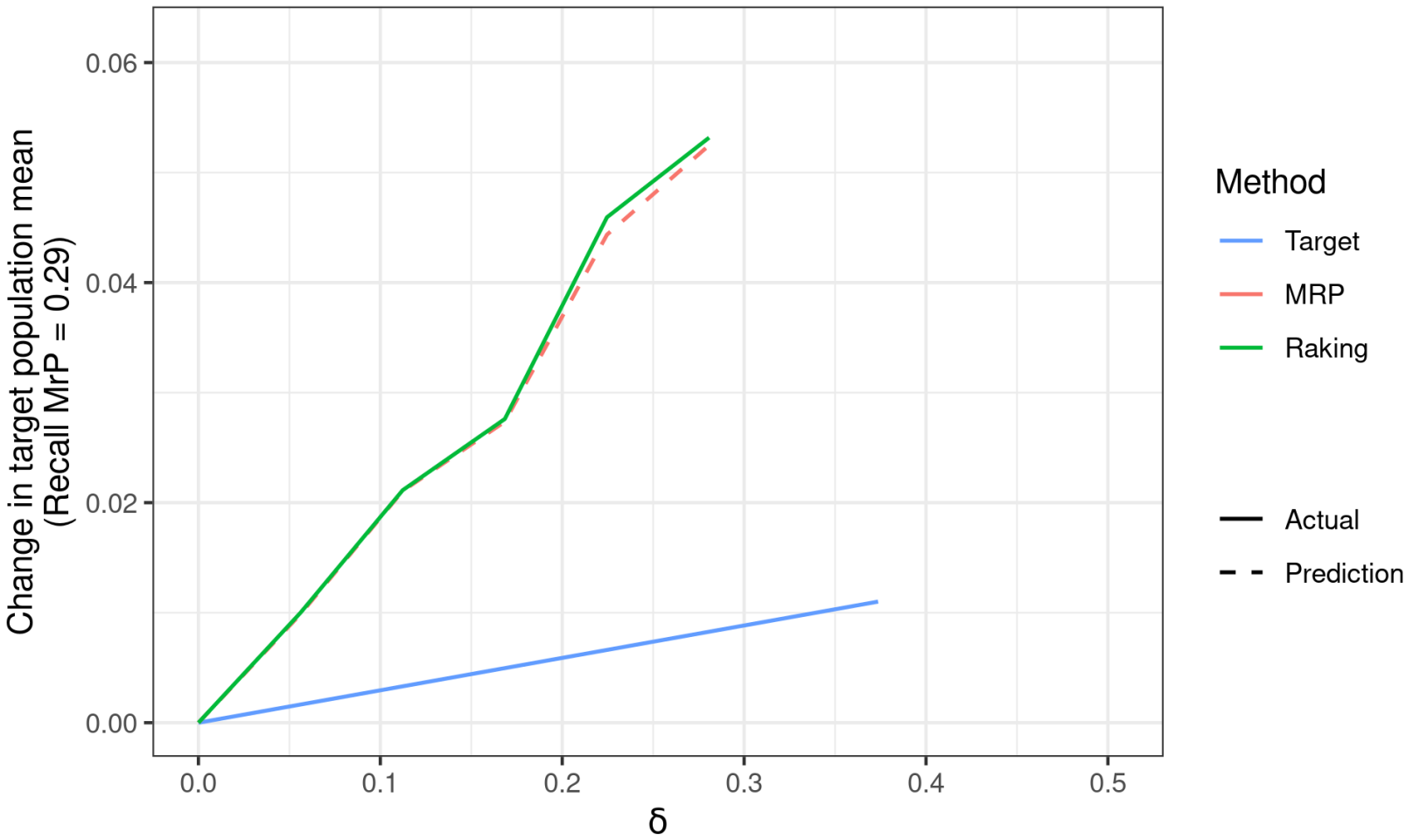


**Figure 3:** Predictions for the name change dataset

# Predictions and actual MCMC results

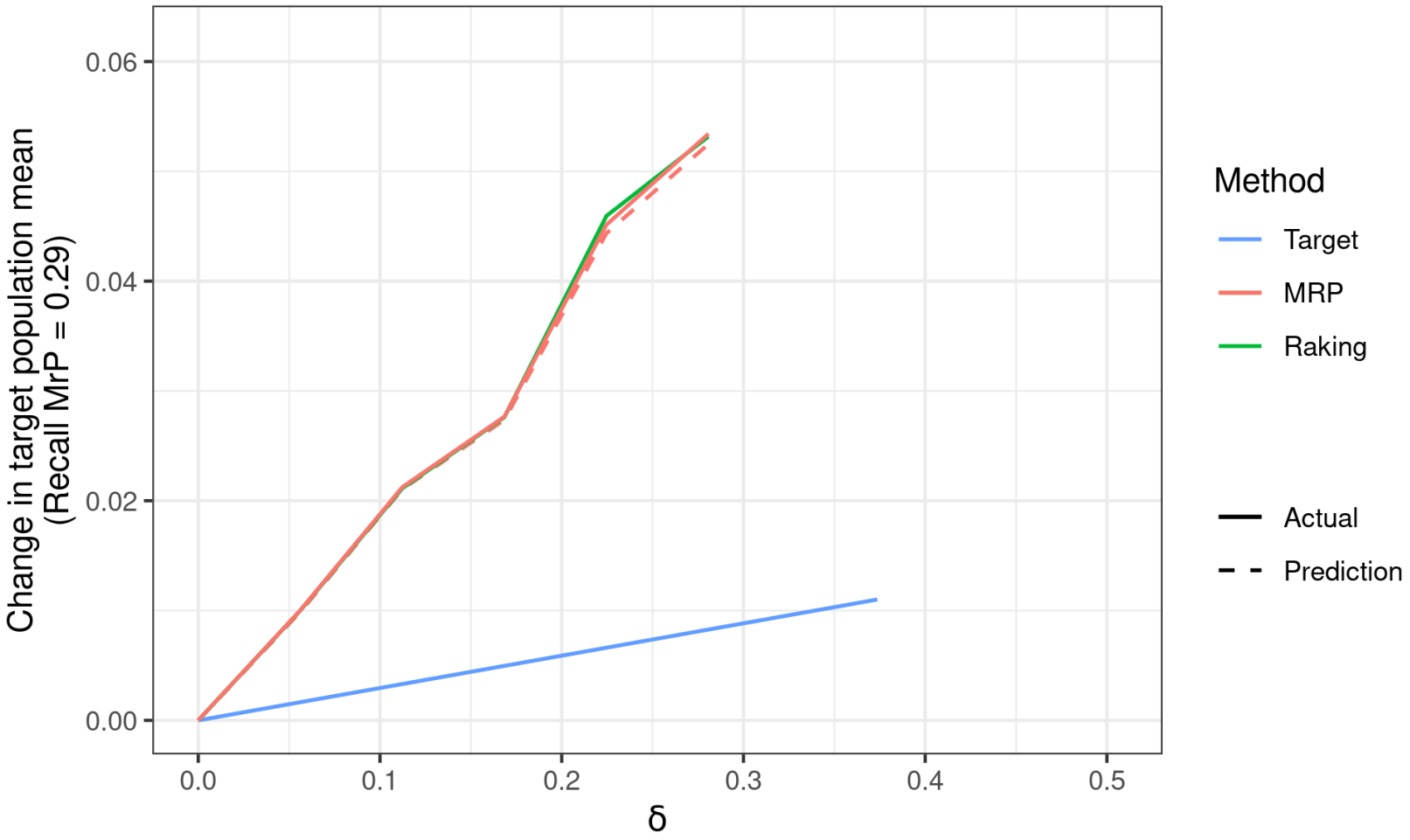


**Figure 4:** Predictions and refit for the name change dataset

Running ten MCMC refits: 10 hours Computing approximate weights: 16 seconds

# Real Data: Lax Philips

Analysis of national support for gay marriage.[4]

- **Target population:** US Census Public Use Microdata Sample 2000
- **Survey population:** Combined national-level polls from 2004
- **Respose:** "Do you favor allowing gay and lesbian couples to marry legally?"
- For regressors, use race, gender, age, education, state, region, and continuous statewide religion and political characteristics, including some analyst–selected interactions.

$$\begin{aligned}
\text{Survey observations:} \quad & N_S = 6,341 \\
\text{Target observations (rows):} \quad & N_T = 9,694,541
\end{aligned}$$

$$\begin{aligned}
\text{Uncorrected survey mean:} \quad & \frac{1}{N_S}\sum_{i=1}^{N_S} y_i = 0.333 \\
\text{Raking:} \quad & \hat{\mu}_{\text{CW}} = 0.33 \\
\text{MrP:} \quad & \hat{\mu}_{\text{MrP}} = 0.337 \quad (\text{Post. sd} = 0.039)
\end{aligned}$$

[4] Based on Kastellec, Lax, and Phillips (2010), see also Lax and Phillips (2009).

# References


Alexander, M. (2019). *Analyzing name changes after marriage using a non-representative survey*. URL: https://www.monicaalexander.com/posts/2019-08-07-mrp/.

Cohen, P. (Apr. 2019). *Marital Name Change Survey*. DOI: 10.17605/OSF.IO/UZQDN. URL: osf.io/uzqdn.

Kastellec, J., J. Lax, and J. Phillips (2010). "Estimating state public opinion with multi-level regression and poststratification using R". In: *Unpublished manuscript, Princeton University* 29.3.

Lax, J. and J. Phillips (2009). "Gay rights in the states: Public opinion and policy responsiveness". In: *American Political Science Review* 103.3, pp. 367–386.

Ruggles, S. et al. (2024). *IPUMS USA: Version 15.0 [dataset]*. DOI: 10.18128/D010.V15.0. URL: https://usa.ipums.org.